

# EUPHORBACEAE

No Minutes should be written on this page. A separate half-sheet to  
be used if required.

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THE ARNOLD ARBORETUM  
HARVARD UNIVERSITY  
JAMAICA PLAIN, MASS., U.S.A.

September 22nd, 1941

Mr. R.E. Holttum  
Botanic Gardens,  
Singapore

PERSONAL

Dear Mr. Holttum:

In the last number of the "Journal of the Washington Academy of Science", Dr. O.F. Cook, of the U.S.A. Department of Agriculture, has published an incredible article on Hevea. The gentleman in question must be insane to reel off such stupidities, as you may readily learn reading his "vapours". Since he does not like Hevea he renames it Siphonia, then to add to the discomfiture of the reader he kneads it up with Caoutchoua. In brief, the contribution in question is incredible and you should read it to decide whether I exaggerate.

Normally, a thing of the kind goes to the wastebasket, where it belongs. But I am sure that in this case some confusion will result. Seeing a work by somebody who is on the staff of the Department of Agriculture of the U.S.A., which is published by the Washington Academy of Science, the candid reader will believe that Cook is justified in some measure in changing names for these very important economic trees. The truth is that he is not justified at all.

I have written a short article on the score, which I include. If you think you can use in any coming number of of your Journal you are welcome to it. I am not very anxious to have it published very soon, either. For instance: I would rather have it published in the autumn ~~on the very first number~~ of 1942 than in the Spring. I am sure that I will have oppositions for "tapping on the head" Dr. Cook, and I never care to have oppositions coming up when the time for being reconfirmed on the staff here comes up. That time, I should specify, is between January and April each year, so I do not care to have anything ruffling the waters in those months, or ~~too~~ shortly before January. From August to November are the best months, that is, the safest. Seeing that I do not particularly indorse the use of "old names" our good friend Corner will understand where I stand. Then, of course, with Corner I believe that we should confess that we are still very much ignorant of the systematy of tropical plants. To confess that here... Oh mais non... jamais! We know all.

Sincerely yours,

*René Corjat*

mss. of 13 pages attached

*Dr. Furtado*

*pl. see attached*

*He does not explain what Cook has done*

*so I cannot judge whether he effectively refutes Cook.*

*Have you any comments?*

*Ray W. J. 1/11/41*

I did not receive this in time to reply. Corjat's paper seems to me unsatisfactory because it does not concisely state to what he objects and why: it is too diffuse. There is too much diffidence already in this matter.

*Ret 1942.*

Copy CROIZAT  
Holt Aboe to Harvard University  
Jamaica Plain, Mass. U.S.A.

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## On the nomenclature of the Rubber Tree

Several correspondents have called my attention to a recent article of ~~Mr~~ O.F. Cook ( in Jour. Washington Acad. Sc. 31:46-65. 1941 ) in which this author renames the cultivated Rubber Tree Siphonia Ridleyana and ~~reviews~~ comments ~~concerning~~ its history, nomenclature and classification.

It is evident that this article proves to be confusing to economic botanists and agronomists who are not especially interested in ~~the~~ ~~unintentional~~ taxonomy. Few of its readers, for instance, are ~~even~~ aware that Cook, in addition to renaming the Rubber Tree, does something else, as follows: (1) He certainly publishes a new combination, Caoutchoua guianensis ( Aubl.) Cook; (2) He seemingly effects a transfer calling for a second combination, Siphonia janeyirensis (Mueller Arg.) Cook ; (3) He implicitly breaks up Hevea into Caoutchoua and Siphonia. ~~There is no doubt that this is a very serious error and that it will cause much confusion in the future.~~

In his treatment Cook sharply dissents with everyone of the botanists and taxonomists who before him have dealt with the cultivated Rubber Tree. His conclusions are altogether novel and ~~unfounded~~ <sup>supported</sup> ~~by~~ <sup>a loose use of</sup> historical and botanical references. Nor is this all. ~~The~~ discussion is frequently interrupted by digressions that ~~are~~ <sup>are</sup> puzzling to a casual reader as they involve controversial issues of nomenclature. To verify Cook's statements rare texts must be consulted and the Rules of International Nomenclature must be thoroughly understood.

Since Hevea is one of the most important of our economic trees, not only, but belong] to a family, the Euphorbiaceae, in which are other economically important genera such as Aleurites, Manihot, Ricinus and Euphorbia I expect to deal briefly in the coming pages with some of the fallacies of



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Cook's paper. My own conclusions concerning this paper are summarized by ~~four~~ <sup>three</sup> synonymies which it is interesting to record without undue delay. It is not my intention to consider <sup>here</sup> Cook's historical notes, and even less to deny that they are interesting.

Nomenclatural changes are of common occurrence in taxonomic practice and it is not unconceivable that a hasty reader of Cook's article may come to the conclusion that there is some justification <sup>for instance</sup> ~~for~~ publishing ~~ing~~ Siphonia Ridleyana Cook, 1941, to replace Hevea brasiliensis Muell. Arg., 1865. This is absolutely not the case. Cook rejects Hevea brasiliensis merely because he does not like this name, which is ~~unacceptable~~ forbidden by the Rules of International Nomenclature ( Art. 16, Art. 59, Art. 60(1) ). ~~Therefore~~ <sup>moreover</sup> Cook attacks the Rules themselves, disputing their soundness in principle as well as in detail. F3/4

The Rules of Botanical Nomenclature are the product of a theory and practice of botany that has survive<sup>d</sup> close to two centuries of international ~~botanical~~ usage. ~~For anyone~~ To suppose that the Articles and the Recommendations in these Rules are either fully bad or fully good is a manifest fallacy. It is but plain common sense to believe that they are fairly good, because thousands of men of different minds at work upon the same problems can not always and completely err in their conclusions.

It is common sense, likewise, to believe that they can be made better, because science moves on, and a critical study of the issues that bob up in its wake <sup>can</sup> never ~~be~~ be dismissed as superfluous, boring, or deplorable.

~~Speaking of the~~ <sup>With the</sup> ~~of several generations of botanists,~~ The Rules freely admit ( Art. 74 ) that the Articles and the Recommendations can be altered, rejected or modified. This admission is hedged in by the ~~conditional~~ clause that changes can be introduced into the Rules only at the proper time and in the prescribed manner. Since little has been done so far to regulate the work of the bodies which are charged with the actual writing up of the Rules, it is not to be denied that ~~many botanists have~~ <sup>exist</sup> a legitimate ground of complaint against ~~some~~ certain Articles ~~and~~, and the manner in which proposals <sup>(votes)</sup> ~~may~~ happen to be ~~introduced~~ in and out the Rules.

So far, so good but not an inch farther. Since in a democracy, such as botany is, the minority is not lined up against a wall but is allowed to survive and to use the pen as their sword, grievances can be <sup>freely</sup> ventilated and proposals discussed in view of turning the minority into a majority. ~~and the majority is not~~ <sup>incorporated</sup> ~~incorporated~~. Once an Article has been approved by the Botanical Congress it can neither be rejected nor be mutilated to have it state what it does not mean. A botanist is left free to follow good usage when the consequences of the Rules are doubtful ( Art. 5 ), and he is <sup>expected</sup> ~~supposed~~ to use his freedom in such a manner that stabilizes nomenclature ( Art. 4 ), stability of names ~~being the ultimate goal of the Articles~~ <sup>incorporated</sup> being the ultimate goal of the Articles. A clear mandate <sup>there</sup> ~~in~~ <sup>it is</sup> the Rules is there to stay, and it shall stand <sup>until</sup> properly revoked. If this mandate is unwise it can be fought best by those who rigidly enforce it. Enforcement will lead to inconveniences <sup>may</sup> ~~which~~ be brought to the attention of the <sup>competent</sup> ~~proper~~ bodies at the proper time. Flouting Articles because they are not liked or not understood ~~may~~ begets anarchy much sooner than reform. Some contend that the Rules are a nuisance, as it were cavils laid over botany. Be <sup>this</sup> ~~it~~ so: the alternative to the Rules is chaos in nomenclature. This is an evil, that is, something that is <sup>far</sup> ~~less~~ tolerable than a nuisance.

Cook points out that the name Hevea is based upon a misapplication of native names and that Aublet was guilty, anyway, of introducing into taxonomy swarms of barbarous ~~words~~ words. This is true as a fact. It is not less true a fact, however, that the Rules ~~say~~ ( Art. 15 ) <sup>say</sup> ~~the purpose~~: " The purpose of giving a name to a taxonomic group is not to indicate the characters or the history of the group, but to supply a means of referring to it ". They state likewise ( Art. 25 ): " These (generic) names may be taken from any source whatever, and may even be

composed in an absolutely arbitrary manner ". In plain English: the Rules understand and define botanical names as pure labels, not as abridged treatises of phytogeography, biology or linguistics. Thus, we have here two facts, as follows: (1) Aublet has misapplied the <sup>vernacular</sup> name heve to the plant which he has published as Hevea; (2) The Rules say ~~unambiguously~~ that Aublet has validly published Hevea, nevertheless.

Which one of these two facts interests primarily the botanist? The latter, <sup>of a certainty,</sup> for the very simple reason that the name Hevea has no more significance or value than a label. I write about Hevea guianensis because I am informed. Aubl. ~~knowing~~ <sup>in so doing,</sup> that any botanist in any country of the world knows that I speak of a certain plant which Aublet has described and illustrated in 1775. I accept this name with a full realization that it is objectionable on grounds other than those of nomenclature. My acceptance of it does not mean as yet that I am <sup>completely</sup> ignorant of the history of this plant. The Rules do not exert <sup>any</sup> ~~unbearable~~ coercion upon me as a scientist when they order me to use the name Hevea guianensis. I am altogether free to write a volume to tell the world how objectionable is this name, and how great are the misconceptions and errors that <sup>have</sup> presided upon its birth. I use this name as a label, not as a badge of mental subservience, to a tyrannical <sup>alien</sup> power.

It is but natural that the Rules should treat botanical names as labels. <sup>Chaos</sup> ~~without order or confusion~~ would <sup>come</sup> ~~arise~~ if the Rules were to concern themselves with the "philosophical" preoccupations of this or that taxonomist, providing an Article for those who believe that the species is a "complex", and a second Article for those who believe that the species is an "individual" or anything such. The Rules disclaim any <sup>special</sup> wish to interfere with ~~the~~ individual opinions concerning taxonomic categories ( Art. 13 ) for the very same reasons that ~~in~~ any civilized



country is loath to have its legislators write up laws to tell a citizen when to get up in the morning. Taxonomist John Doe may happen to believe as Gospel's truth that the trinomial typicus<sup>m</sup> is rank poppycock and that those who use it are guilty of a gross betrayal of "good" botany, but botanist John Smith may believe even as firmly that such a trinomial is pure gold. The Rules, as between the two, know better than <sup>to</sup> take sides, realizing that both may be right today and ~~wrong~~ wrong tomorrow. Meanwhile, John Smith may publish as many trinomials typicus<sup>2</sup> as he likes, and John Doe may reduce them all to synonymy, the one telling the other <sup>in the process</sup> how hopelessly mistaken he is in his "biological concepts", in his believing the species to be a "collection of individuals" instead ~~that~~ of something else, and the like. The Rules stand by silently. All they are interested in is to arbitrate the game, and to see to it that the player <sup>ultimately</sup> abide by a certain code of practice which prevents the discussion from becoming a brawl. Rules are needed, and must be closely followed, if John Doe is to relegate to proper synonymy everything which John Smith does and the other way around. Obviously, the Rules step in when John Doe in the heat of the argument violates priority, uses a nomen confusum, publishes a nomen alternativum and the like. The names are labels, and the labels that read "Vinum annorum C" can not be put on a flask<sup>s</sup> filled with "Aqua pumpae". That is all: let everybody think what he wishes, but let all deal their cards out according to the rules of the house.

It may be objected that the Rules are hopelessly wrong in taking such an "artificial" view of nomenclature. <sup>If so,</sup> ~~write up a new set of~~ Let those who believe that the Rules are wrong write up a new set of Articles to make them right. Since, as Cook points out, it is unbearable <sup>to treat</sup> ~~have~~ as Asclepias syriaca a weed that hails from New England, and as Simmondsia chinensis a shrub <sup>native to</sup> ~~from~~ Southern California, let us see what

can be done to remedy these wrongs. We have scores of epithets like: orientalis, occidentalis, australis, septentrionalis, marianus, ~~marianus~~, virginianus, canadensis, brasiliensis, mauritanicus, aethiopicus, sarmaticus, ponticus, chinensis, indicus, and so forth, which are glaringly misapplied in their relation to species. Not only, but Euphorbia antiquorum L. never was the true "Euphorbium of the ancients", <sup>and</sup> E. officinarum L. never was the sole source of the gum euphorbium, secured prevailingly from E. resinifera Berg. Errors in the designation of geographic origin, in the indication of commercial uses and the like are rife all over the records of taxonomy. Once the gate is open to "correct" botanical names on such grounds as the ones just stated, why not change the name of a plant that is glabrous and its author <sup>, nevertheless</sup> has dubbed pubescens? Why, which is worse yet, tolerate that the main biotype of a complex enjoys only trinomial status when an insignificant form of this complex, having been described first in time, bears <sup>a</sup> full binomial name?

Would-be reformers face a serious issue: they must remedy existing evils <sup>, meanwhile,</sup> seeing to it that these evils <sup>under their hasty manipulations</sup> do not become worse. Since the proper place for introducing corrections into the Rules is in the Articles that are most immediately concerned, let those who object against the botanical names being labels write up another text under Art. 15, to state, for instance, that the purpose of giving a name to a taxonomic group is to indicate the characters and the history of the group. So written, Art. 15 will please botanists who do not like Hevea.

Other botanists, however, will object pointing out that once the principle <sup>is accepted</sup> that "corrections" can easily be made, <sup>we must know who is to</sup> ~~correct~~ <sup>make corrections</sup>, when, <sup>true</sup> why and how. And it is here that the difficulty lies.

Cook's biting castigation of " indexers, cataloguers, or  
 even herbarium assistants " who believe, as he states, that new names must  
 be accepted at once, and old names summarily discarded has no support in  
 fact. The Rules have never stated, nor do they state, that new names must  
 be accepted at once, and that old ones must be cast off forthwith. Stability  
 of nomenclature, not priority is the fundamental purpose of the Articles. <sup>(Art. 4, Art. 21)</sup>  
 A botanist ~~presented~~ presented with freshly unearthed old names ~~without~~ <sup>is not</sup>  
 being placed thereby <sup>under</sup> the immediate <sup>obligation</sup> necessity of accepting them. A  
 name may be so old, paradoxical as this ~~may~~ seem, that having been used  
 by too many authors in too many senses it must <sup>ultimately</sup> be discarded as a perma-  
 nent source of confusion and error ( Art. 62 ). Likewise, an old name  
 which can not be properly applied is rejected ( Art. 63 ), with the under-  
 standing that it may be used <sup>again</sup> ( Rec. xxxvii ), if its correct use can be  
 determined. An old name which is based upon a type-specimen <sup>resulting from</sup>  
 two plants confused together, and believed <sup>by the author of the name</sup> to be a single one, is to be  
 discarded ( Art. 64 ). A monstrosity does not warrant the publication  
 of a name, and an ancient name published for an occasional aberrant  
 form has no legitimate status in nomenclature ( Art. 65 ). <sup>Most significant</sup> ~~Even~~ of all,  
 an acknowledged old name, effectively published and having full legitimate  
 status, may be disposed of in favor of a younger one in ~~some~~ special  
 cases ( Art. 21 ), this principle having been extended to preserve certain  
 spellings as against certain others, Bougainvillea, for instance, as  
 against the perfectly correct <sup>Latinized form</sup> Buginvillea. Cook's statement that : " The  
 older names are never completely discarded, but remain in reference use  
 among students of botany who have sufficient interest to follow the histo-  
 ry of a plant to the original sources " is both true and false. It is

true to the extent that older and illegitimate names remain in the synonymy of the plant involved, this synonymy revealing the history of the entity in taxonomy and, mayhaps, in economic botany. It is false ~~when~~ it is read to imply that old names, or what <sup>are</sup> supposed to be old names, are necessarily legitimate in nomenclature. One may agree with Cook wholeheartedly that "Constructive reforms are needed to keep taxonomy as a part of the study of plants and to open this field of natural interest to a wider public", but one does not discover at a glance the connection that binds such constructive reforms with <sup>the</sup> ~~renaming~~ <sup>of</sup> Hevea brasiliensis <sup>illegitimately</sup> ~~as Siphonia Ridleyana~~, as Siphonia Ridleyana. I do not know whether in quoting Santayana as a successful critic of botany <sup>because this is</sup> "a trivial, overtechnical science with a peevish insistence on the right names for flowers", Cook does actual justice to the intention of that author. Santayana <sup>and he</sup> is a philosopher <sup>and he</sup> knows that one of the first and most important steps taken in the ascent of man is the discovery of language, which made it possible for certain names to be attached to certain objects. Santayana, most likely, alludes <sup>in that text</sup> to the doings of botanists who, being handed <sup>(r)</sup> a correct and standardized label, refuse to use <sup>it</sup> and insist upon speaking a language of their own <sup>merely</sup> because the color of the paper is not to their fancy.

Once of the chapters <sup>in</sup> of Cook's <sup>article</sup> ~~work~~ is titled "Siphonia an alternative name", and in <sup>it</sup> ~~the chapter~~ Cook says: "The notion of disregarding the names that were considered by their authors as provisional is one of the strange proposals in recent efforts to reform the system of nomenclature". Once again there is no support in the Rules for this interpretation. It is true that Art. 37 ter is poorly worded, and that serious misinterpretations have crept in about the difference between "provisional" and "alternative" names. Anyone who reads the Article in question



and the debates which have led to its adoption knows that a name considered by its author as provisional is not a nomen provisorium under the Rules. Let us not confuse <sup>the right</sup> ~~issue~~ <sup>for example,</sup> at the start, and mistake <sup>is necessarily</sup> the word "crime", as it is being used in colloquial language, with the term "crime" as it reads in the laws of the land. To allow good food to go to waste may be a "crime" to a housewife, but ~~this is not~~ <sup>is necessarily</sup> a "crime" to a <sup>gowned</sup> judge sitting on the bench. <sup>likewise, a</sup> ~~provisional~~ name ~~is not~~ <sup>provisional</sup> ~~is not~~ <sup>is not</sup> under the Rules merely because an author <sup>openly</sup> states in <sup>its</sup> the publication that he is not certain whether the name will stand as ~~given~~ <sup>given</sup>. To coin a true provisional name under the Rules a botanist must publish or use two or more names at the same time, making the acceptance of one of them contingent upon events to be verified in the future. I may publish Planta quaevis stating that this name has "provisional" status because I am not certain of the genus and even less of the rank, whether a good species or a trinomial, <sup>but</sup> ~~and~~ this does not make me guilty of publishing a provisional name under the Rules. I become guilty of coining such a name under the Rules when I publish in the same paper, and at the same time, both Planta quaevis and Arbor quaevis, tagging two names to one and the same entity, and leaving it to somebody else (in the future to decide) which one of these two names is "good." That names of the kind, the latter one at least, are not legitimate is readily understood. The reasons why it is so are at least three, as follows: (1) The interests of stability and certainty of nomenclature are not served when one plant is <sup>contemporaneously</sup> published under two or more names. Let each plant bear one name, and let each name be properly and definitely dated as to its publication. This is straight recording ~~to secure a~~ <sup>to secure a</sup>

(2) It is convenient, to say the least, that each publication should be perfect in itself, that is, that everybody <sup>should</sup> know that it was made at such date, by such author, and that it <sup>was</sup> delivered to the press without trailing if's and but's. Since a true provisional name becomes "good" only when certain conditions are verified, what are we to think of it so long as these conditions have not come to pass? Is it good or not? <sup>meanwhile</sup> By what rule? <sup>judge</sup> How are we to know?; (3) It is unethical that an author should refuse to decide an issue but should retain the right to tell another author, who is willing to decide <sup>it</sup> ~~the issue~~, <sup>is the</sup> what name to use. Let everybody coin his own names and use them ~~him~~ himself, standing squarely behind what he does. In a classic instance of nomen provisorium which I have discussed a short time ago ( Croizat in Jour. Arnold Arbor.

21: 499. 1940; see also Croizat, op.cit., 22: 137. 1941 ) Hooker uses the name Croton laevifolius Bl. ( Fl. Brit. India 5:391. 1887 ) for a certain plant from N.E. India (Khasia). Then, <sup>in</sup> the next page, under C. Griffithi Hook.f., he states: " A solitary specimen of Griffith's from Malacca ( Kew Distrib. 4779 ) has the very slender racemes of C. laevifolius and lepidote ovaries.- It is possible that this is the true laevifolius of Blume; and if so, the Khasian plant so called

should bear the name of khasianus ". Hooker's hesitations ~~invite~~ the following comment: " Please, do secure on loan the holotype of C. laevifolius, or at least some well authenticated material, and make up your mind whether the Khasian plant is C. laevifolius Bl. or a new species, C. khasianus Hook. f. If you publish C. khasianus and are wrong, your name will go to synonymy. If you <sup>are</sup> ~~happen to be~~ right, you will have one more binomial to your lasting credit. All I ask you, please, is to make up

your mind. Why should I be expected to do your work and to check Blume's specimen? Why should I not be free to use any name I wish, if I am the one to decide whether the Khasian plant is different from C. laevifolius? True ~~enough~~, you may not as yet be in the position to reach a conclusion because you have not enough material available. This I understand. But why should you have the right of publishing a name by anticipation when I have no such right myself? Science goes on endlessly, so, please, let each one of us work out that problem for which he has the material or about which ~~about~~ he feels competent. The future will take care of itself! I trust that the shadows of Hooker, in the Great Beyond where there are no wars and everybody is <sup>blessed with common sense</sup> ~~intelligent~~, forgive me if I address them in colloquial American upon an issue that Hooker, not being bound by our Rules, was after all free to solve any way he wished. I believe, rather, that Hooker's spirit, reminding itself of having once lived as a great and fair botanist, chuckles, seeing that the beings of the flesh must speak the plainest language in order to be understood <sup>even</sup> by their brothers in the craft. F3/13

The fallacies in Cook's work are so numerous that it is actually impossible to discuss them all within the limit of <sup>basely technical</sup> ~~a~~ <sup>this</sup> ~~useful~~ paper. It might be true, although it is not quite certain, that tree- and plant-names in Latin take feminine adjectives, to agree with arbor or herba as an implied appositive. It is undoubtedly true that the modifications introduced in Art. 72 by the Amsterdam Congress of 1935 are ambiguous and confusing, leaving it uncertain what is to be done about the gender of generic names. But the generic names in use in taxonomy are not <sup>all</sup> ~~entirely~~ Latin. Many, and these are legitimate too, are derived from Greek roots compounded in the modern manner or used according to classical usage, or <sup>taken</sup> ~~from~~ unclassical language. Rules are needed to determine the gender of these names. As to Hevea and Evea being, or not, homonyms, the Rules provide a good answer. They decide ( Art. 70, " Examples Of Different Names " ) that Durvillea and Urvillea are different names, which settle the issues to everybody's knowledge.

Every botanist has a duty and a right in regard to the Rules. He has the duty of studying and knowing them, and has the right to ask his fellow-workers to do the same. This is because the Rules protect any and all, and provide <sup>convenient</sup> a meeting ground for the exchange of ideas and data. The right of insurgency and secession against the Article, be it manifested in willfull



considering

and over-pumping

7/1/20



- 1) Hevea brasiliensis Muell. Arg. in Linnaea 34:204. 1865  
Jour.  
Syn. Nov. : Siphonia Ridleyana Cook in Washington Acad. Sc. 31:46-65.  
1941.
- 2) Hevea guianensis Aubl. Hist. Plant. Guian. 2:871, Pl. 335 (sphalm.: peruviana  
). 1775.  
Syn. Nov. : Caoutchoua guianensis ( Aubl. ) Cook in Jour. Washington  
Acad. Sc. 31:58. 1941.
- 3) Hevea janeirensis Muell. Arg. in Martius, Fl. Brasil. 11[2]:706. 1874.  
Syn. Nov. : Siphonia janeirensis ( Muell. Arg. ) Cook in Jour.  
Washington Acad. Sc. 31:61. 1941.

I hope that these <sup>precise</sup> synonymies conform with Cook's <sup>vague</sup> ~~somehow~~  
~~obscure~~ treatment of Hevea, Siphonia and Caoutchoua. I restrict them to the  
barest essentials because I do not intend at this writing to enter into the  
merits of the classification of Hevea. It is clear in my understanding that  
much is to be done in the <sup>treatment</sup> ~~classification~~ of the Euphorbiaceae in general  
before we can have this classification put on a tolerable basis. Here, I merely  
deal with six labels of which three are correct on technical grounds of nomen-  
clature ~~and the other three are manifestly erroneous on the same grounds. Placing the~~  
while three others are manifestly erroneous on the same grounds. Placing the  
synonyms where they belong is quite a different <sup>deed</sup> ~~thing~~ than deciding which  
are the characters, for instance, that may or may not separate specifically  
Hevea brasiliensis from H. janeirensis. To this <sup>at</sup> ~~we~~ will <sup>at</sup> tend later.

Btztg 6 Febr. 1939

*Euphorbiaceae*

Dear Henderson,

Numerous thanks for your kindness in tracing 2 numbers of Materials absent in my series. I have ordered the Euph. by Gage and have tried also to get No. 1 which is the last part which fails. I will have them rebound as they are thrown through one another, which can easily be done without much cost. The only gear I have is that No. 1 is not longer available. Will wait and see. Possibly they have odd numbers of the journal at Calcutta. Many thanks for all the trouble you took.

Sincerely yours

*C. G. Gage*

F3/16  
The monograph of the Euphorbiaceae is only par of Gage's msc. and gives only some genera, if I remember well only 7 genera. Has this been decided on Malay Peninsula materials by the editor in Calcutta. Have they tried to get funds in the Peninsula. The reason they mention is the existence of the Flora by Ridley. But I believe that Gage's work will exceed Ridley's in usefulness. It is a pity that the rest of Gage's work will never be published any further.



# BRIEFKAART KARTOEPOS

ADRES

ALAMAT



Mr. M. P. Henderson.

Botanic Gardens

Singapore.

NAAM EN ADRES VAN DEN AFZENDER  
NAMA DAN ALAMAT SIPENGIRIM

HERBARIUM EN MUSEUM VOOR SYSTEMATISCHE  
BOTANIE VAN 's LANDS PLANTENTUIN  
..... BUITENZORG (JAVA);

618/36.

17th December,

6

Dear Dr Quisumbing,

I wonder if you would be so kind as to lend me specimens of Cheilosa homaliifolia Merrill (Euphorbiaceae). I find that specimens from Malaya, described as Baliospermum malayanum Hook., are really Cheilosa and I cannot see how to distinguish them from Merrill's description of C.homaliifolia. We have only one specimen of C.homaliifolia in Singapore, namely Ramos 1667: it is identical with the Malayan species except for the edge of the leaf. If my surmise is correct, it means that Merrill's name becomes a synonym, which will be unfortunate, but I suppose such is the rathless advance of science and better now than later. I have written to Dr van Steenis to ask him about Cheilosa montana, because I verily believe Cheilosa malayana will have to be reduced to C.montana and we shall again have Cheilosa as a monotypic genus.

I apologise for the long delay in returning the specimens of Ficus subgen. Synoecia which you so kindly lent me. I shall do so early next year. I have been delayed because I have been trying to locate the type of Ficus scratchleyana, and I have also been trying to get specimens of the Formosan F.terasoensis for comparison with your F.megacarpa. In both objects, I have been unsuccessful. However, King's description of F.scratchleyana is very good, and relying on that, I determine your Philippine

Dr. E. Quisumbing,

Bureau of Science,

Manila, PHILIPPINES.

F3/17



specimens named F.apiocarpa as F.scratchleyana, which is known only from New Guinea. F.scratchleyana is the easternmost representative of the subgenus and it is very interesting to find it in the Philippines. F.apiocarpa seems not to occur in your country: it is a species of the Sunda shelf.

Thanking you, again, for your ready assistance.

Yours sincerely,

E. J. H. C.

Assistant Director of Gardens, S.S.

*Euphorbiaceae*

T

# MEMORANDUM

G 39

From

Curator of the Herbarium,  
Botanic Gardens, Singapore.

25th July 1938.

To

Veterinary Officer,  
Pahang.

Your No.4 in V.Phg.222/38.

The specimen is Agrostistachys Gaudichaudii (Euphorbiaceae),  
Malay name Julong-julong.

I cannot find any reference to any poisonous properties  
it may possess and it is certainly not usually regarded as in  
any way poisonous.

*Lu*

Official Memorandum.

4 in V. Phg. 222/38.

Raub, 22nd July, 1938

From Veterinary Officer,

Pahang.

To The Curator,

Botanical Gardens,  
Singapore.

I forward herewith leaf samples of a jungle shrub or tree? known locally in Temerloh as Kechulun (cf. Wilkinson's dictionary - *Clerodendron disparifolium*). I would appreciate your identification, the correct generic name and any information concerning its assumed poisonous properties and the nature of the active principle involved.

*Agrostis*  
*Gaudichaudii*

C. Lloyd Turner  
Veterinary Officer,  
Pahang.

OSMELIA MAINGAYI and  
ANTIDESMA VELUTINOSUM

Euphorbiaceae

here (and may be still) compared in  
this. See above.

F3/21



*Euphorbia*

624/32


18th October, 2.

Dear Sir,

I should be very grateful if you could let me have an authentic specimen of Richeviella gracilis (Merr.) Pax and K. Hoffm. (*Baccaurea gracilis*, Merr.) with flowers.

This genus has been collected in the Malay Peninsula, but I have no material of the Philippine species for comparison, and the two seem closely allied.

Yours faithfully,

  
Curator of the Herbarium.

The Director,  
Bureau of Science,  
Manila,  
Philippine Islands.

ccg

THE GOVERNMENT OF THE PHILIPPINE ISLANDS  
DEPARTMENT OF AGRICULTURE AND NATURAL RESOURCES  
**BUREAU OF SCIENCE**  
MANILA

ADDRESS REPLY TO:  
DIRECTOR,  
BUREAU OF SCIENCE,  
MANILA, P. I.

December 3, 1932.

The Curator of the Herbarium,  
Botanic Gardens,  
Singapore, Straits Settlements.

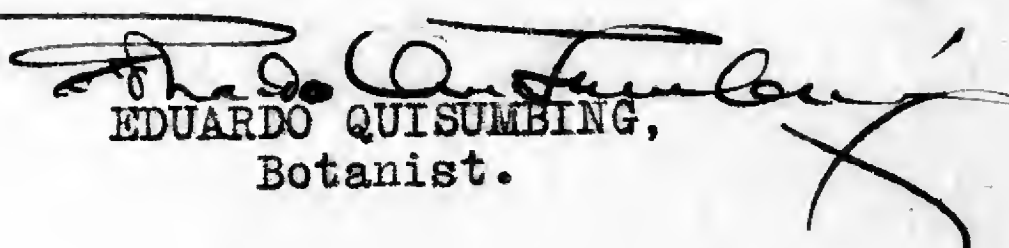
My dear Dr. Henderson:-

In reply to your letter of October 18th, 1932,  
(No. 624/32), I have the pleasure to advise you that  
under separate cover I am sending you a package con-  
taining two flowering specimens of Richeriella gracilis (Merr.)  
Pax & Hoffm. Hoping that the specimens will reach you in  
perfect condition.

Very truly yours,

WILLIAM H. BROWN,  
Director, Bureau of Science.

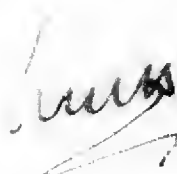
By

  
EDUARDO QUISUMBING,  
Botanist.

EQ

Returned

3/1/33



45903. Richeriella gracilis (Merr.) Pax & Hoffm. Bur. Sci.  
Coll. McGregor. Palawan, Sept., 1925. (EUPHORBIACEAE)

29249. Richierella gracilis (Merr.) Pax & Hoffm.  
For. Bur. A. L. Cenabre. Puerto Princesa,  
Palawan. Feb., 1923.

ccg

THE GOVERNMENT OF THE PHILIPPINE ISLANDS  
DEPARTMENT OF AGRICULTURE AND ~~NATURAL RESOURCES~~ Commerce  
BUREAU OF SCIENCE  
MANILA

• ADDRESS REPLY TO:  
DIRECTOR,  
BUREAU OF SCIENCE,  
MANILA, P. I.

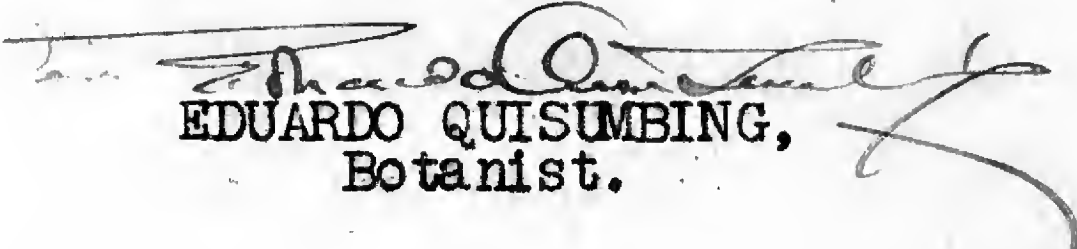
January 27, 1933.

Dr. R. E. Holttum,  
Director, Botanic Gardens,  
Singapore, Straits Settlements.

My dear Dr. Holttum:-

This is to acknowledge receipt of 2 mounted  
herbarium specimens of Richeriella which were  
loaned to you about a month ago. The material  
arrived in very good condition.

Very sincerely yours,

  
EDUARDO QUISUMBING,  
Botanist.

EQ

GOVERNMENT OF BENGAL

OFFICE OF The Superintendent, Royal.....

Botanic Garden, Calcutta.

DEPARTMENT.

GROUP.

BRANCH.

No.....*4/1017*.....

FROM

K. Biswas, Esq., M.A.,  
Curator of the Herbarium, Royal Botanic Garden,  
Calcutta.

To

The Curator of the Herbarium,  
Botanic Garden, Singapore, Straits Settlements,

Dated the *19<sup>th</sup>* Decr., 1932.

Subject:—

Sir,

I have the honour to acknowledge with many thanks  
the receipt of the specimen of *Sumbavia macrophylla* Muell  
Arg., the return of which has been advised in your letter  
No. 688/32, dated the 29th November, 1932.

I have the honour to be,

Sir,

Your most obedient servant,

*K. Biswas*

Curator of the Herbarium,  
Royal Botanic Garden, Calcutta.



637/32

20th October, 2.

Sir,

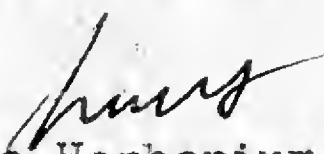
I should be very grateful for an authentic duplicate of Sumbavia macrophylla, Mull. Arg. if you can spare one, or instead the loan of a specimen for a short time.

What is apparently this plant has recently been collected in the Malay Peninsula, but we have no material for comparison.

I have the honour to be,

Sir,

Your obedient servant,

  
Curator of the Herbarium.

The Curator of the Herbarium,  
Botanic Gardens,  
Calcutta,  
India.

29th November, 2.

Sir,

I am very grateful for the loan of the specimen of Sumbavia macrophylla, Muell. Arg., which is being returned to you under separate cover.

I have the honour to be,

Sir,

Your obedient servant,

  
Curator of the Herbarium.

The Superintendent,  
Royal Botanic Gardens,  
Sibpur,  
Calcutta.

GOVERNMENT OF BENGAL.

OFFICE OF...The Superintendent, Royal....

Botanic Garden, Calcutta.

DEPARTMENT,

GROUP.

BRANCH.

No.....*H/966*.....

FROM

K. Biswas, Esq., M.A.,  
Curator of the Herbarium, Royal Botanic Garden,  
Calcutta.

To

The Curator of the Herbarium,  
Botanic Garden, Singapore.

Dated...the 8th Novr., 1932.

Subject:—

Sir,

Your letter No. 637/32, dated the 20th October,  
1932.

I am sending by separate post a duplicate sheet  
of *Sumbavia macrophylla* Muell Arg, bearing field No.  
11800. Kindly return the sheet securely packed when you  
have done with it. Please acknowledge receipt of the  
sheet.

I have the honour to be,

Sir,

Your most obedient servant,

*W. D. S. Siva Sani*

For: Curator of the Herbarium,  
Royal Botanic Garden, Calcutta.

*diffusum*

26th April, 33.

Dear Dr. Smith,

I have to acknowledge with very many thanks your letter of 3 April, with the identification of Phyllanthodendron coriaceum, Gage. I note your remarks on the modification of the generic diagnosis as given by Ridley.

Yours sincerely,

*H. M. R. Anderson*

Dr. J.J. Smith,  
Endegeester Straatweg 16,  
Oegstgeest,  
Leiden,  
Holland.

Osgood, 3-IV-1933.

Dear Mr. Henderson,

I have just received your letter by air mail with the description and figures of the *Euphorbiaceae* plant in question. I have little doubt it is:

*Phyllanthodendron coriaceum* Sage.

Ridley in his *Flora* pt. II, 205 describes 6 petals. I think you are correct in calling them disc glands.

In the case the plant belongs really to the genus *Phyllanthodendron* and if the diagnosis as Ridley cites it, is correct, the name should be modified as to include also this species: in the ♂ flower there are no petals, only 3 stamens showing only their bases, no pistillode, 6 disc glands.

One of these days I will return the material together with the description and figures.

Yours sincerely,

J. M. Smith.



141/33

24th January,

3.

Dear Dr. Smith,

Under separate cover, I venture to send you a mounted sheet of an Euphorbiace~~ous~~ plant. This has quite puzzled me and I was unable to trace it at Kew. Dr. van Slooten at Buitenzorg has also failed to recognise it, and suggested that I should send it to you. Unfortunately I have only this one sheet on which female flowers are very scarce, so I am sending you a short description of the flowers and some sketches made under the camera lucida.

Any help you can give me will be very much appreciated.

Yours sincerely,

*(Sd) M. R. H. H. H.*

Dr. J. J. Smith,

Endegeester Straatweg 16,

Oestgeest, (near Leiden)

Holland.

565/38.

4th January

39.

Dear Nelmes,

When I was last at Kew I remember seeing the latest part of the Materials for a Flora of the Malay Peninsula, containing Euphorbiaceae by Gage. At that time (1936) it was either newly published or you had advance copies. Unfortunately I did not note particulars of where this was published, although I suppose it was in the Journ. Roy. As. Soc. Beng. However, as Biswas of Calcutta, to whom I have written, does not seem to know about it, I should be very grateful if you could confirm that it was published and give me the volume etc. in which it appeared. Biswas says that the Index to the Materials is in the press.

Yours sincerely,



E. Nelmes, Esq.,

The Herbarium,

Royal Botanic Gardens,

Kew, Surrey,

ENGLAND.

# GOVERNMENT OF BENGAL

OFFICE OF the Superintendent, Royal Botanic Garden,

Sibpore near Calcutta.

GROUP.

BRANCH.

No. *Lib...* 61... 4-38.

FROM

Dr. K. Biswas Esq, M.A., D.Sc., F.R.S.E.,

Superintendent, Royal Botanic Garden,

To Sibpore near Calcutta.

The Curator of the Herbarium ,

Botanic Gardens, Singapore, Straits Settlements.

Dated 22nd December, 1938.

Subject :—

Sir,

With reference to your letter No. 565/38 dated the 5th December, 1938, I have the honour to furnish you with the following list of publications by the late Sir George King and Col. Gage on the Materials for a flora of the Malay Peninsula published in the Journal of the Asiatic Society of Bengal. As regards the Journal of the Asiatic Society of Bengal ( now Royal Asiatic Society of Bengal ), you will have to apply to the General Secretary, Royal Asiatic Society of Bengal, 1 Park Street, Calcutta. The Records of the Botanical Survey of India Vol. IX. no. 2 , 1922 as well as Kew Bulletin no. 7, 1914 are, I think, already in your library. The Index ~~for~~ the flora of the Materials of the Malay Peninsula is now passing through the press and will be published by the Royal Asiatic Society of Bengal.

I have the honour to be,  
Sir,

Your most obedient servant ,

*K. Biswas*

Superintendent Royal Botanic Garden, Calcutta.

Materials to the flora of the Malay Peninsula published  
in the following journals.

1. Journal of the Asiatic Society of Bengal Vol.LXVI.pt.2,189
2.     "                 "                 "                 Vol.LXV.pt.2,1896.
3.     "                 "                 "                 Vol.LXIX,pt.1,1900.
4.     "                 "                 "                 Vol.LXX pt.2,1901.
5.     "                 "                 "                 Vol.LXXI.pt.2,1902.
6.     "                 "                 "                 Vol.LXXII.pt.2,1903.
7.     "                 "                 "                 Vol.LXXIII.pt.2,1905.
8.     "                 "                 "                 Vol.LXXIV.pt.2,1909-10.
9.     "                 "                 "                 Vol.LXXV , 1912-15.
- 10.Records of the Botanical Survey of India,Vol.X.No.2,1922
- 11.Kew Bulletin of the Miscellaneous Informations,No.7,1914

BAMBUSEAE

NOTES MADE BY J.L. PESTANA  
(LABORATORY ASSISTANT)

SPECIMENS COLLECTED BY HIM  
ARE PLACED IN THE  
GARDENS HERBARIUM



(G 3)

|                                     |  |
|-------------------------------------|--|
| From Whom ....                      |  |
| Place ....                          |  |
| Date ....                           |  |
| <b>SUBJECT</b>                      |  |
| Mosses                              |  |
| Correspondence with H. W. Dixon Esq |  |
| 1925.                               |  |

| <i>Connected Papers</i> | <b>MINUTES</b> |
|-------------------------|----------------|
|                         |                |

No Minutes should be written on this page. A separate half-sheet to  
be used if required.

---

*G. verticillata*

H. N. Ridley 119

cited



spikelet



flr. glume



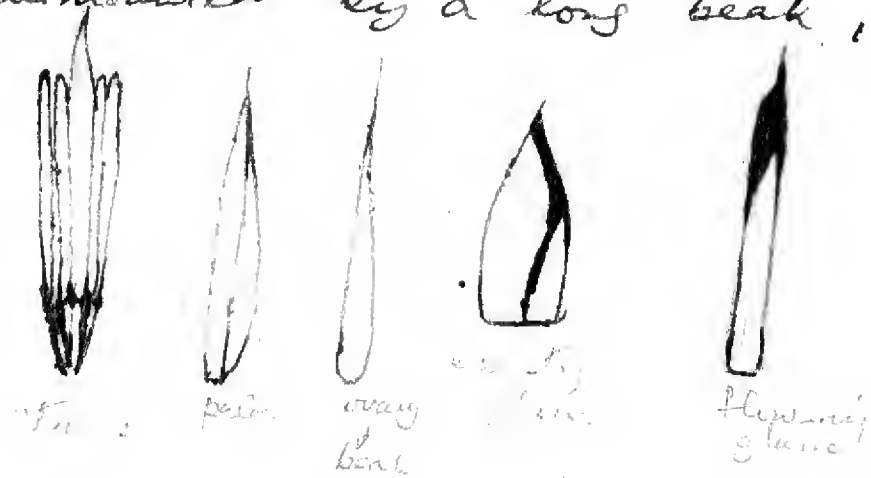
palea



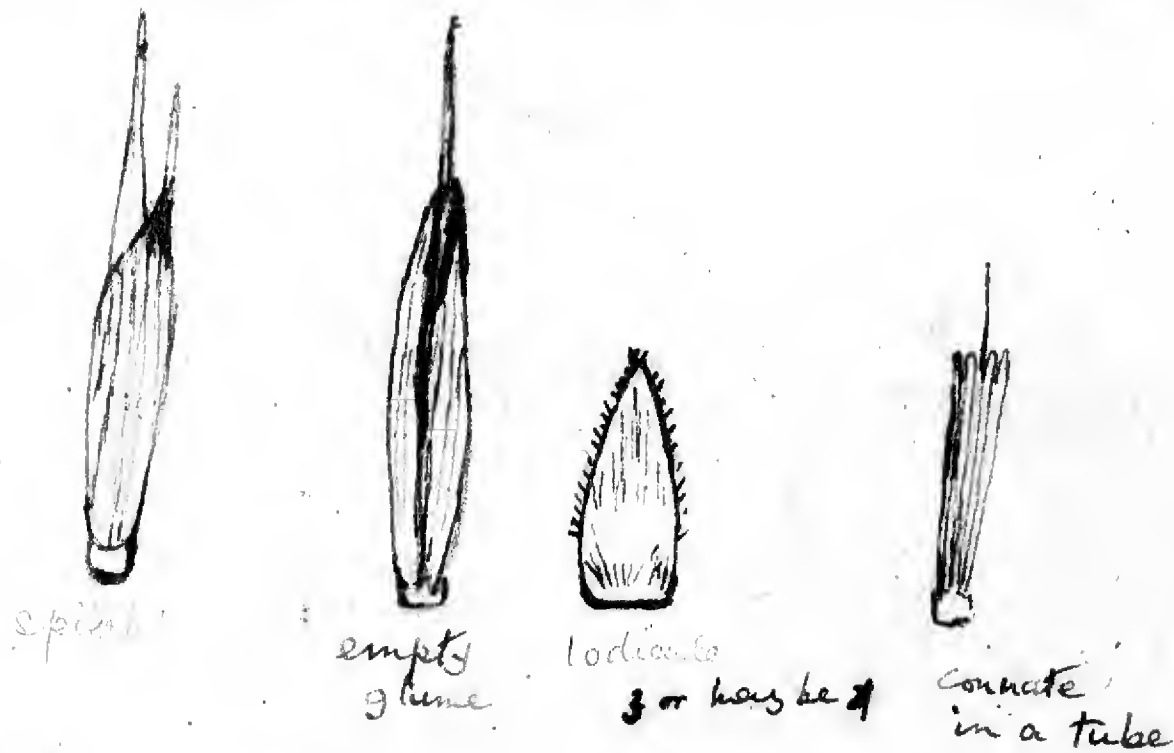
ovary

Schizostachyum chilonanthum - stamens exserted, anthers long in comp. with filaments, which are free. ovary very small, <sup>oblong</sup> lodicules three, stigmas 3, plumose; flowering glume - many nerved, <sup>anther almost</sup> <sup>only above & furrowed, slightly ciliate</sup> pearly convolute, the upper margin ciliate; palea - <sup>not</sup> keeled convolute; sep. organs only  $\frac{1}{2}$  half the length of palea.

Schizostachyum Blumei, Kees at Esch. - margins of glumes purplish black <sup>spikelets</sup> .6 to .7' long, very narrow, cylindrical with 1 fertile flower, flowering glumes oblong, long, mucronate, striate; paleae 1 or 2. membranous, not keeled, convolute. lodicules none; stamens exserted; anthers elongate, blunt. Ovary narrow, ellipsoid. surmounted by a long beak, the style with 3 plumose stigmas.

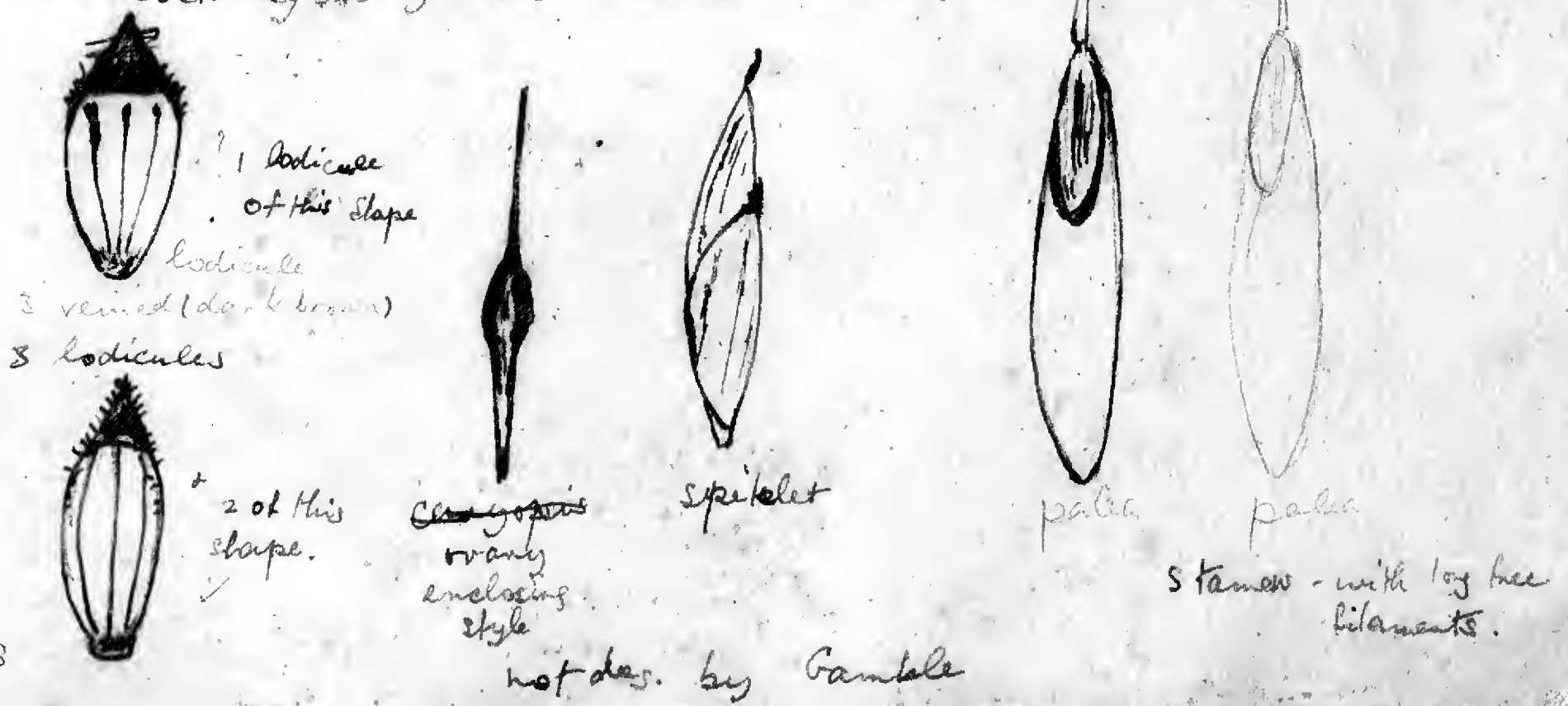


Schizostachyum insulare? (not descr. by Gamble) det. Gamble no. 8323 F. Dept.



Empty glumes 2, ovate, mucronate. Flowering glumes lanceolate, bristly at the tip. Palea lanceolate, convolute. Stamens 4, connate. Ovary narrow, sub-cylindric. Lodicules oblong-rounded, light-brown pubescent.

Schizostachyum grande Ridl. No. 20162 F.M.S. det. I. H. Burkill.





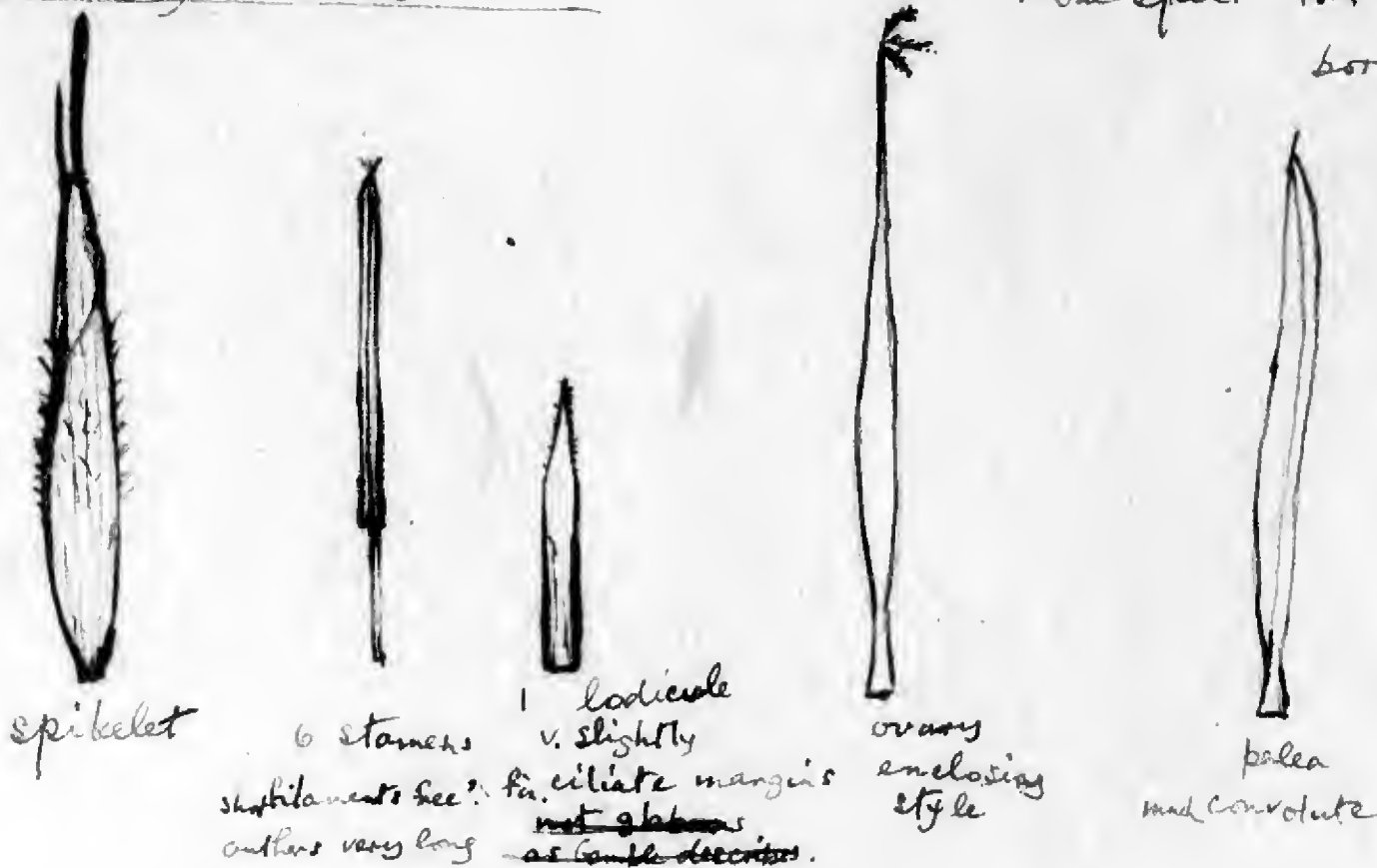
*Schizostachyum grande*. Spikelets very slender. Glumes ribbed, shortly mucronate. - shorter than palea. Palea - lanceolate. acuminate - partly 2-keeled, convolute. Stigma 2? anthers exserted, - filaments very long & free - ovoid - beaked, lodicules three - ovate-lanceolate, with 3 prominent dark veins.

*Schizostachyum aciculare* :

from spec. 16423 S.F.N.

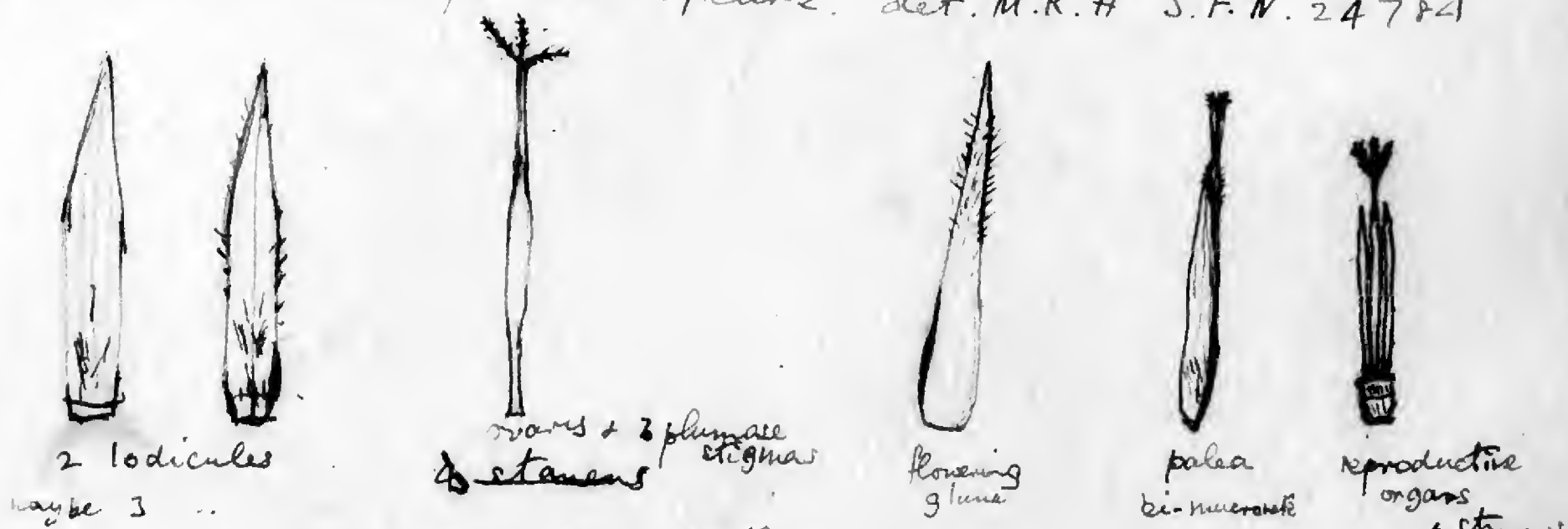
borrowed from F. Dep.

det. I. H. Burkill



Spikelet  $\pm$  1.2 to 1.5" long, very narrow, needle-like; empty glumes 2, pubescent, oblong, mucronate; flowering glume linear, much convolute, thick, covered with appressed hairs, long-mucronate; palea also much convolute, glabrous, as long as flowering glume. Only one lodicule, narrow-lanceolate, glabrous, with finely ciliate margins. Stamens exserted; anthers very long, narrow, blunt, penicillate-apiculate. Ovary narrowly ovoid, glabrous, surmounted by a long narrow beak ~~surrounding~~ enclosing the style, which bears 3 short plumose stigmas.

*Schizostachyum longispiculatum*, Kunz. det. M.R.H. S.F.N. 24784



Flowering glume, with long ~~appressed hairs~~ <sup>short bristles</sup>, at 45° on glume. (may be due to boiling - originally <sup>2</sup> appressed; lanceolate-acuminate. Convolute.

Anthers - linear-apiculate, with sharp sharp point, filaments short, connate in a very short tube; ovary narrowly-ovoid with 3 plumose stigmas. Glume & palea especially much convolute  
 might be *S. latifolium*

*S. chilanthum*



spikelet



empty  
glume  
11-nerved



palea  
convolute



lodicules  
3



ovary

*S. Zollingeri*



(1)

2 lodicules



6 stamens



ovary



spikelet



fl. glume  
1.6-nerved  
ciliate at the margins



palea

2-keeled at  
the apex  
ciliate at the margins



(2)

1 lod. of this  
shape



anthers  
pubescent

lodicule

style enveloped  
in membrane

anthers pubescent

lodicules 3, ciliate  
at the margins.

filaments free?



(3)

1 lod.  
of this

Oxytenanthus nigrescens



spikelet



palea  
+ sexual organs



staminal  
tube when young  
elongated tube older



anther



when  
older



flowering  
glume  
with long black  
cilia at the apex

flowering glumes with transverse nervelets - 12 nervelets

Amelanchier alnifolia



spikelet



staminal  
tube

R. N. S. P. det. Barkhill. P. L. 22.11.31. R.F.N. 6421



spikelet



flowering  
glume  
19-nerve  
with transverse nervelets



palea  
from older one?

anthers



young  
sexual organs



anther

no lodicules



stigma is noticed  
Anther stage  
before exertion of  
stamens

# Gigantochloa latifolia

Long  
Fifely ciliate at the margins • flowering glume  
oblong lanceolate-acuminate

Only 2 lodicules seen + 3

six stamens

Transverse nervelets



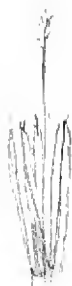
Spikelet



nervelet  
+ 12  
flowering  
glume



Reproductive  
or sexual organ  
showing plumose  
style with 6 stamens  
stamens connate  
to a short tube



Lodicule  
tilted after  
anthesis



anther with  
subulic



Spikelet



flowering  
glume



Lodicule

Glume  
convolute, keeled, glabrous  
ribbed, acute-acuminate  
finely ciliate

*Oxytenanthera auxiculata*

From sp. det. Gamble



spikelet



empty glume

30-nerved with transverse nervelets.



7-nerved ciliate on keel



spikelet



palea, style, stigma & stamens, which are connate in a flat filamentous tube. Stamens exserted.



rep. organs

style slender plumed.



anther



flowering glume

very nerved = 18

+ 2 flowered spikelet somewhat paired. Empty glumes mucronate ribbed, glabrous edge with long pale hairs. Palea keeled, ciliate on keel. Stamens in lower flower 6, monodelphous, pale, acute. Style slender plumed. No lodicules seen.

*Oxytenanthera sinuata* From sp 16895 S.F.N. from I.H.B. det. I.H.B.



palea 2-keeled, ciliate on keel



spikelet



flowering glume 27-nerved



ovary stigma plumed

broadly ovoid, hairy



palea showing relative positions of sexual organs in it

Flowering glume glabrous, keeled, mucronate, edge pale ciliate. Empty glume transverse nerveless.



2 paleae with fl. glume in center.



stamens & style of center palea



anther

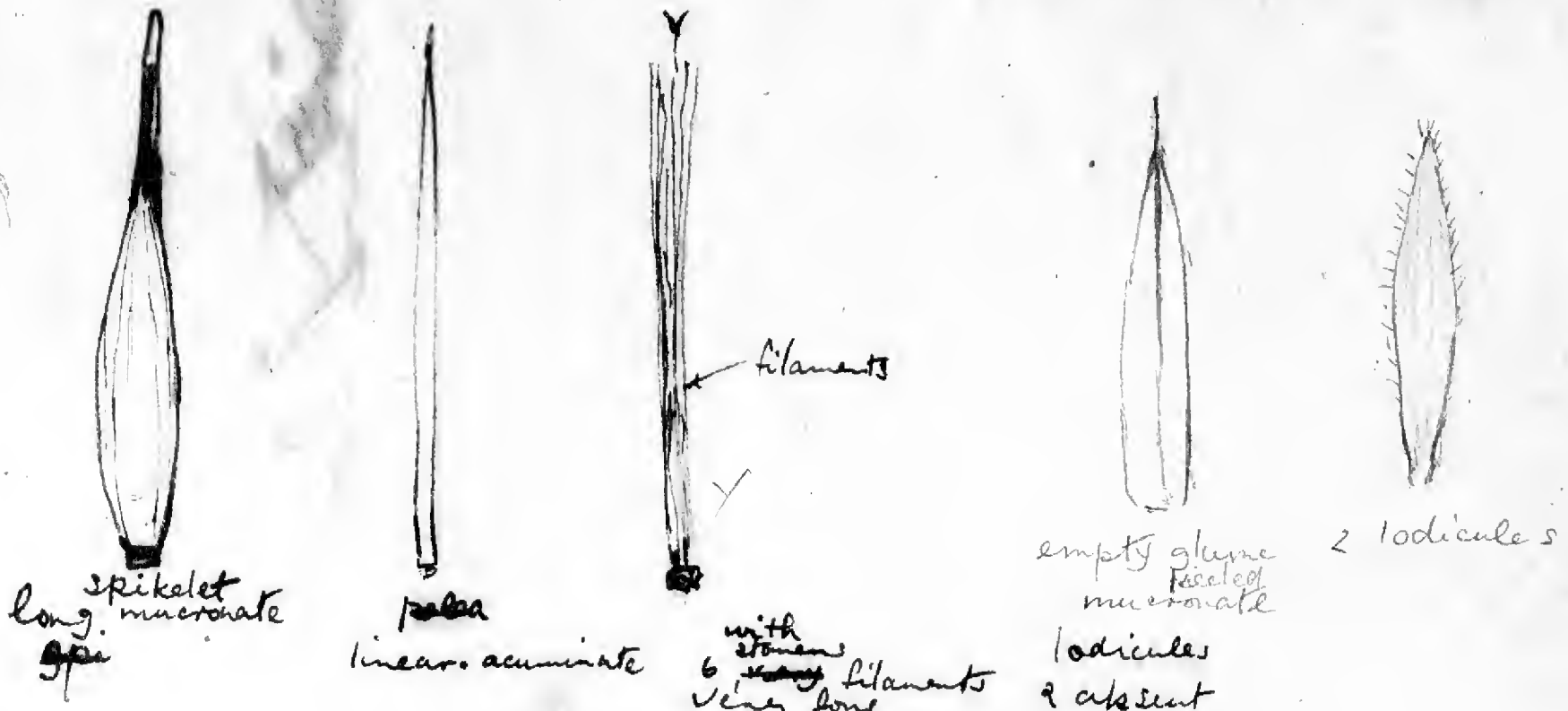
stamens filament short, anther short tube

Empty glumes 2 or 3, ovate, mucronate, edge pale ciliate. Flowering glumes longer. Palea blunt orbifid, 2-keeled ciliate. Stamens? exserted. Ovary broadly ovoid hairy, no lodicules seen.

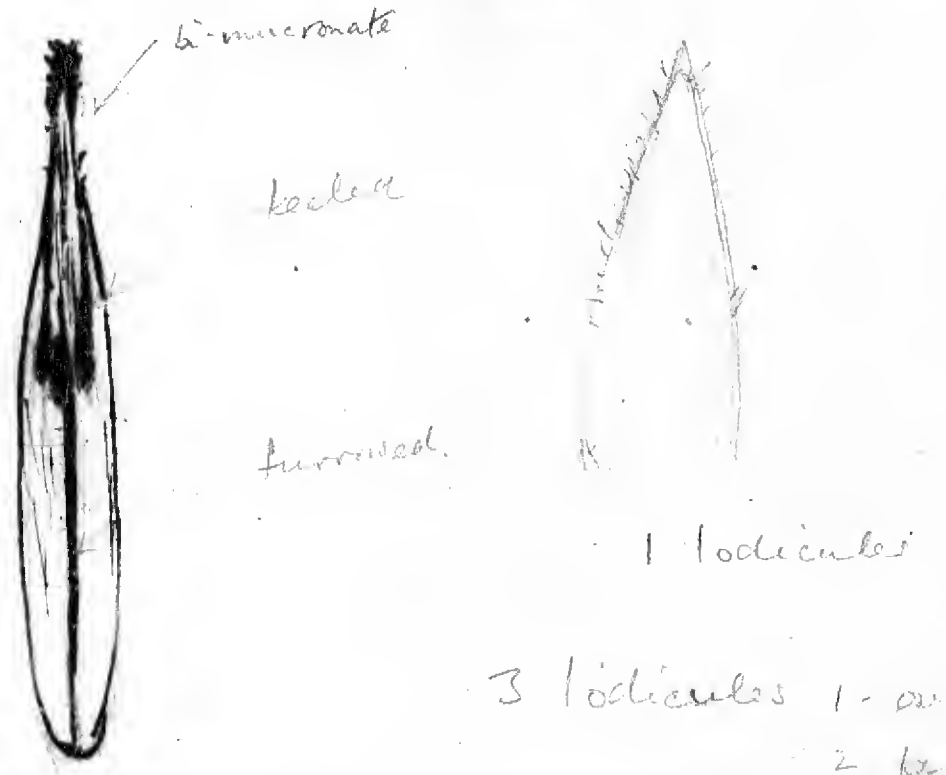
2 to 3 flowered.



*Schizostachyum brachycladum* S.n. 24/2/15 - sheet from For. Dep. det. (H. Burkill)  
Des. neither by Gamble nor Ridley



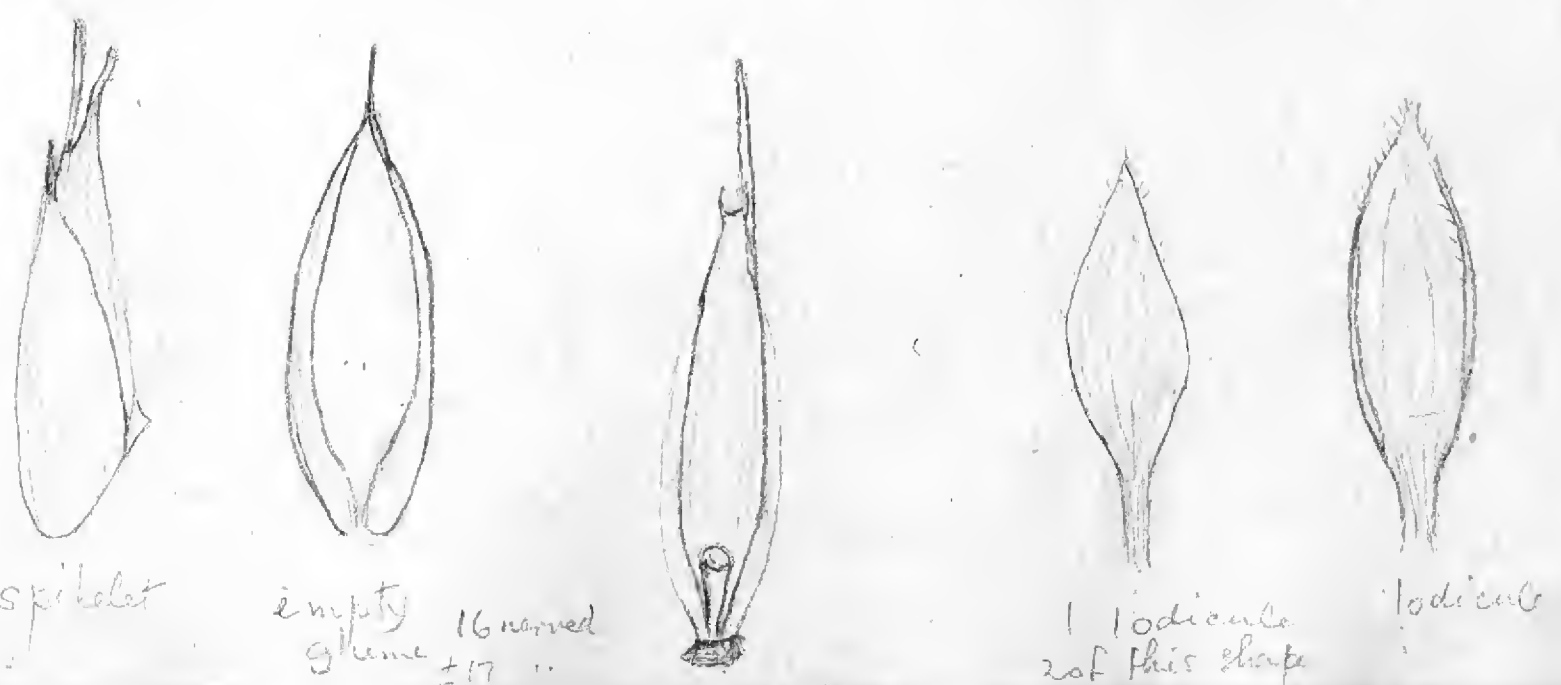
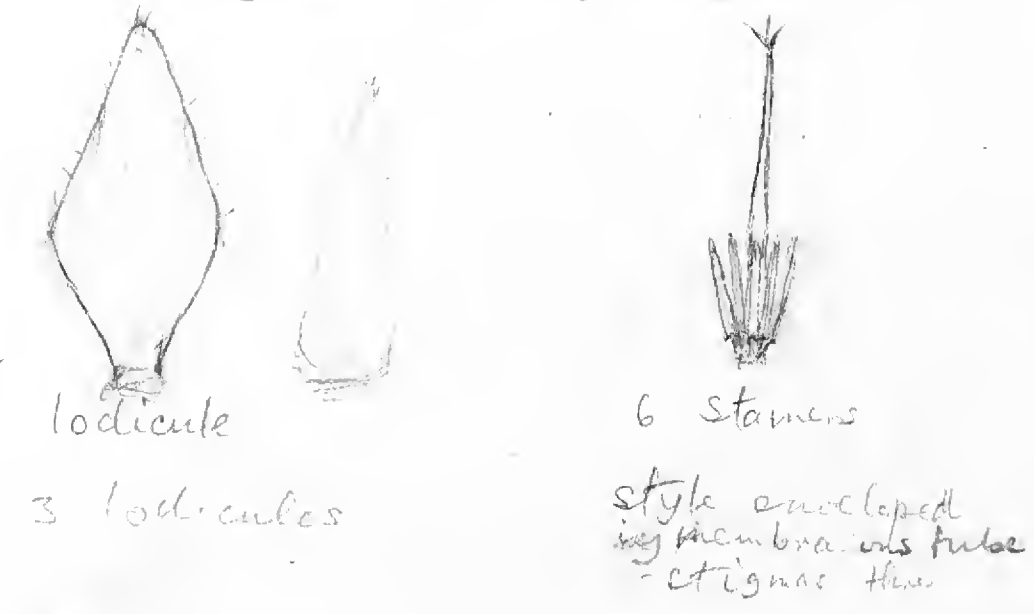
sp. old. ∴ some parts ? missing



3 lodicules 1 - ovate-lanceolate  
2 lanceolate-linear with base narrowed at the end

Glume many-nerved ± 18.

*Schizostachyum brachycladum* from Gardens, Ipoh.



*Gigantochloa ligulata* 22585 det. Hitchcock 1931



spikelet  
ribbed  
longer  
narrower



2' ribbed  
longer  
especially at the apex



2' ribbed  
6 stamens  
3 stigmas

lodicules  
absent

*G. ligulata* 3181  
? *G. ligulata*  
or *G. ligulata*



spikelet



ptyl  
glume



*Conium elegans*  
 spikelet .8' long, .18' wide. Ridley says .5'



spikelet



lodicule



palae  
 2-keeled  
 glabrous

3 lodicules



1. 4 rounded

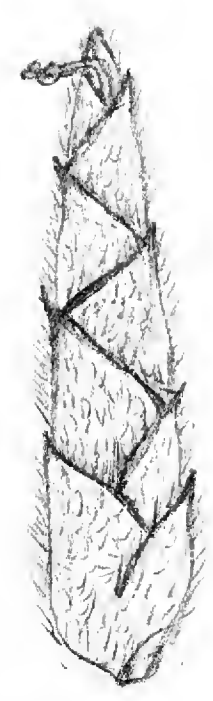
filament free

very short  
 1 stamen

stamen  
 with free filament

the base of the filament at the margin

*G. Zosterophium* - F. D. 1160



Spikelet



16895 B Pahang Bukit Han Det. Burkill

*Oxytenanthera sinuata* - sp. swollen due to excessive heating.  
lt.  $\pm 10$  mm. br.  $\pm 2.2$  mm.



spikelet



2nd palea  
upper palea

2-keeled  
3-d. nerves  
lodicules not seen

empty glumes transverse veined

3 fls in 1 one spikelet



1st palea



3rd palea  
convolute  
not keeled



stamens  
connate



stamen



long pale hairs  
ovary  
stigma



empty glume

$\pm 22$ -nerved

reproductive organs  
if stamens & ovary very dark in colour - dark chocolate

*Polystachya latistachya*, Munro 171



Spikelet  
glabrous, not  
pubescent  
Fls. gl.  
Fls. la-  
perian-  
3-nerved

*latistachya* Jan 16. 1886



Spikelet  
glabrous  
Fls. gl.  
Fls. la-  
7-nerved  
when the keels

3 lodicules  
it may be 1 keel  
and lodicules enclosing  
the central one

ovary

part of  
filament

Six stamens



from upper glume

9598  
lodicules



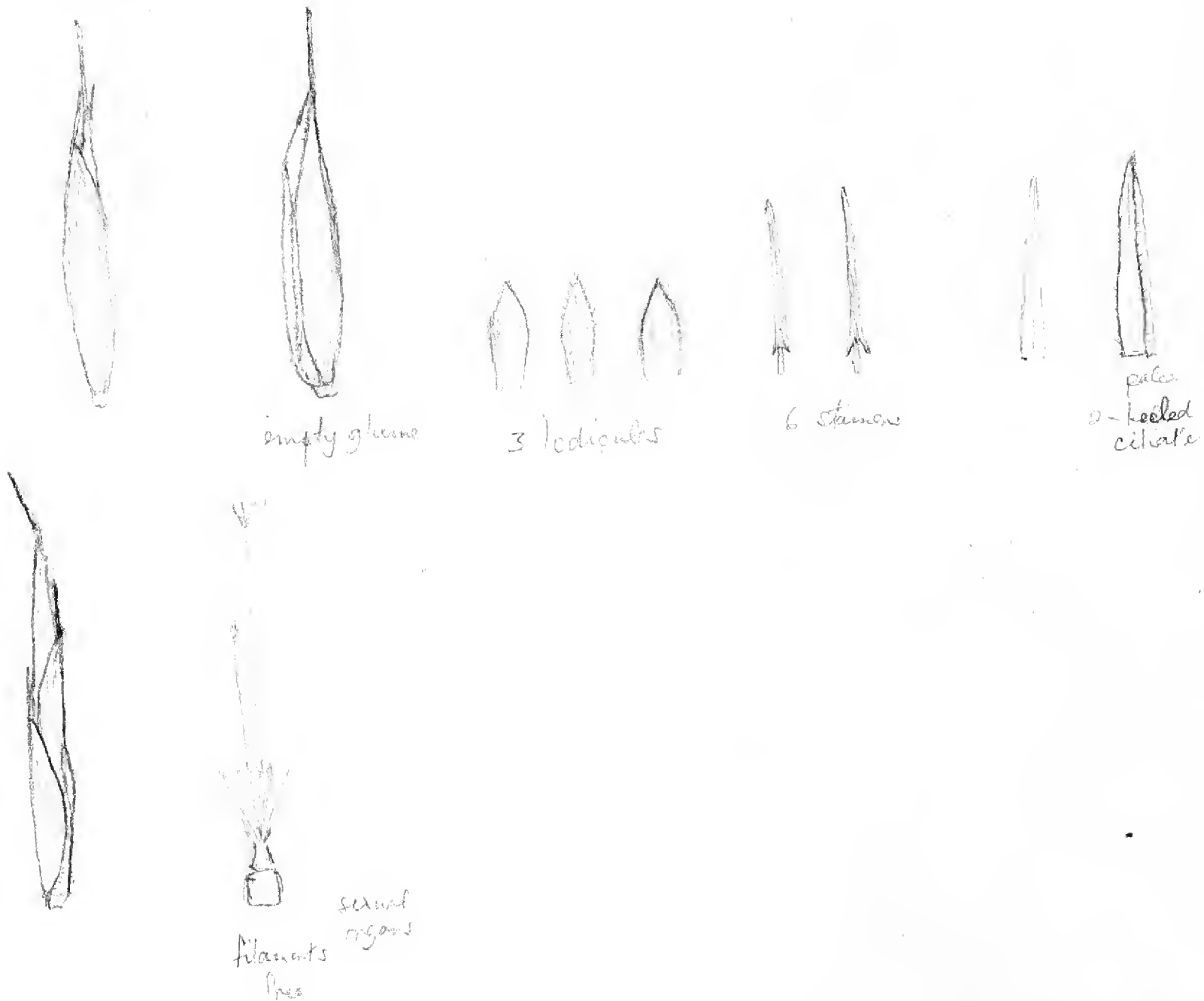
2 lodicules



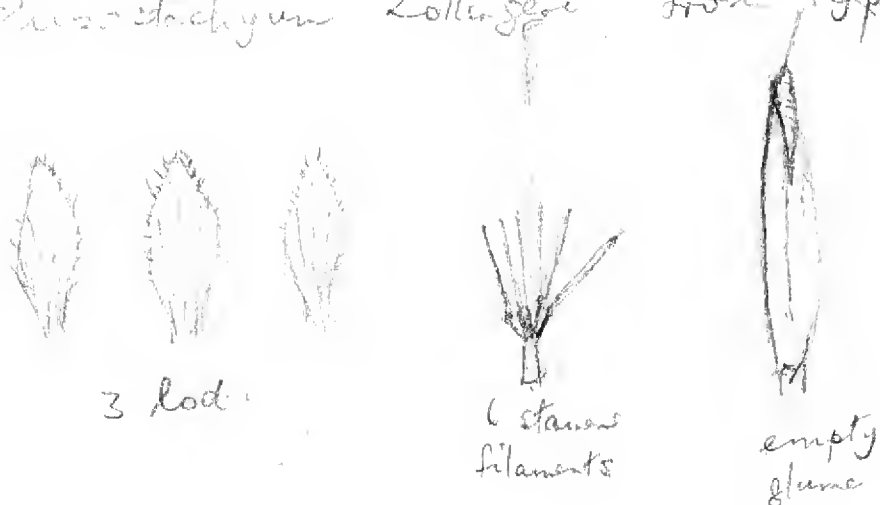
*Schizostachyum aciculare* Coll. J.H.P. Loc: Bkt. Cher. Klang. 4/34



*Schizostachyum Zollingeri* ?



*Schizostachyum Zollingeri* from type sp. referred to in Red Flora Coll. Howe's



F.D 9597 = 9598



spikelets etc. agree with Gamble's illustrations of the sp. *B. pallida*

lodicules

F.D 9061



strobilus

mature head

F.D 926

*S. elegans dumosum*



spikelet



stamen



stamens exserted  
glume with mucronate  
palea ciliate when young



stamen



when old fil. long



st. glume  
15. nerved



palea  
ciliate  
when ± young  
glabrous



palea



palea

no lodicules seen

F.D 9988



stamen



1 pair of paleae  
with sexual  
magn.



palea  
2-nerved

long linear  
at the margin

S.F.N 785 Det. I. H.B.



stamen  
fil. long

very glabrous  
3 to 4 nerved  
2-keeled  
ciliate

F3/50

Gigantochloa ? ligulata

9598 F.M.S.M.



spikelet



palea  
from older glume



young



F. Dep 9990

from older glume

ella m...  
short but here

Stk. Blumei

F.D. 772



3 lodicules



fil. an.

F. D. 4061

spikelet in tube



spikelet



stamen



palea

sexual organs eaten up by insects

F. D. No 32764



undescribed sp.

stamen

3 filaments

ovary & style lodicules absent

spikelet

2 empty glumes

palea complete not hooked 4 to 5 nerved

F. D. 9909

Bambusa nana



empty glume



glume : glume



lodicules

F. D. 10039 = 9538

the glume linear-acuminate, convolute rather

B. pallida



spikelet



palea



stamen



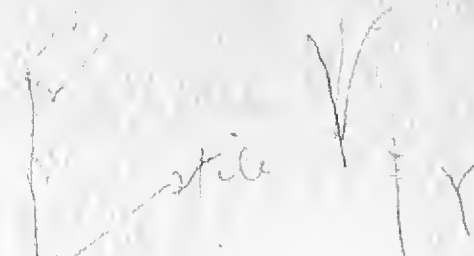
ovary & stigma

2-keeled ciliate at the margins as well as the apex

*S. dumosum*



keelless



*G. levis* from the Philippines



spikelet



flr. glume



lemma  
± six nerves



caul  
organs  
stamens connate  
to a tube



ovary,  
style & stigma

*Gigantochloa apus* (Tawa)



spikelet



± 6 veins



6 stamens flr. glume  
± 19 nerves, normal



anther  
part of  
tube





List of Bamboos in the Botanic Gardens, Singapore.

- |                                    |                                     |
|------------------------------------|-------------------------------------|
| 1. Schizostachyum brachycladum     | 35. B. vulgaris                     |
| 2.       "                       " | 36. "               "               |
| 3.       "                       " | 37. "               "               |
| 4. Thrysostachys siamensis         | 38. "               "               |
| 5. Arundinaria                     | 39. "               "               |
| 6. Schizostachys brachycladum      | 40. Schizostachys brachycladum      |
| 7. Melocanna bambusoides           | 41. Bambusa nana                    |
| 8. Bambusa vulgaris                | 42. Schizostachyum brachycladum     |
| 9. Cephalostachyum pergracile      | 43. Dendrocalamus Hamiltoni         |
| 10. Bambusa vulgaris               | 44. Schizostachyum brachycladum     |
| 11.       "               "        | 45.               "               " |
| 12. Dendrocalamus pendulus         | 46. Gigantochloa sp.?               |
| 13. Schizostachyum brachycladum    | 47. Taeniostachyum Dalloa           |
| 14. Ochlandra sp.                  | 48. Dendrocalamus asper             |
| 15. Thrysostachys brachycladum     | 49. Bambusa tulda                   |
| 16. Bambusa vulgaris               | 50. Dendrocalamus pendulus          |
| 17.       "               "        | 51. Schizostachyum Zolligeri        |
| 18.       "               "        | 52. Gigantochloa Scortechinii       |
| 19.       "               "        | 53.               "               " |
| 20. D. flagellifer                 | 54. Dendrocalamus sp.               |
| 21. Bambusa vulgaris               | 55.               "               " |
| 22.       "               "        | 56. Bambusa vulgaris                |
| 23.       "               "        | 57. Gigantochloa sp.?               |
| 24.       "               "        | 58.               "               " |
| 25.       "               "        | 59.               "               " |
| 26.       "               "        | 60. Bambusa vulgaris                |
| 27.       "               "        | 61. Cephalostachyum sp.             |
| 28. Cephalostachyum sp.            | 62. Bambusa vulgaris                |
| 29. B. vulgaris                    | 63. Bambusa Blumeana                |
| 30. Ochlandra sp.                  | 64.       "       vulgaris          |
| 31. Ochlandra setigera             | 65. Dendrocalamus Hamiltonii        |
| 32. B. vulgaris                    | 66. Taeniostachyum Dulloa           |
| 33.       "               "        | 67. Bambusa spinosa                 |
| 34.       "               "        | 68.               -                 |

- 69. *Bambusa vulgaris*
- 70. *Bambusa spinosa*
- 71. -
- 72. *B. vulgaris*
- 73. " "
- 74. " "
- 75. *Ochlandra setigera?*  
to verify
- 76. *Bambusa vulgaris*
- 77. " "
- 78. *Gigantochloa apus*

- 69. *Bambusa vulgaris*
- 70. *Bambusa spinosa*
- 71. -
- 72. *B. vulgaris*
- 73. " "
- 74. " "
- 75. *Ochlandra setigera?*  
to verify
- 76. *Bambusa vulgaris*
- 77. " "
- 78. *Gigantochloa apus*

20 July List of Bamboos in the Botanic Gardens, Singapore.

|    |   |    |   |
|----|---|----|---|
| 1  | <i>Schizostachyum brachycladum</i>                        | 56 | <i>Bambusa vulgaris</i>                         |
| 2  | ..  | 57 | <i>Gigantochloa</i> sp.?                        |
| 3  | ..  | 58 | ..  |
| 4  | <i>Thrysoetachys siamensis</i>                            | 59 | ..  |
| 5  | <i>Arundinaria</i>  | 60 | <i>Bambusa vulgaris</i>                         |
| 6  | <i>Schizostachys brachycladum</i>                         | 61 | <i>Cephalostachyum</i> sp.                      |
| 7  | <i>Melocanna bambusoides</i>                              | 62 | <i>Bambusa vulgaris</i>                         |
| 8  | <i>Bambusa vulgaris</i>                                   | 63 | <i>Bambusa Blumeana</i>                         |
| 9  | <i>Cephalostachyum pergracile</i>                         | 64 | .. <i>vulgaris</i>                              |
| 10 | <i>Bambusa vulgaris</i>                                   | 65 | <i>Dendrocalamus Hamiltonii</i>                 |
| 11 | ..  | 66 | <del><i>Taeniostachyum</i></del> <i>Dalboia</i> |
| 12 | <i>Dendrocalamus pendulus</i>                             | 67 | <i>Ochlandra</i> <del>Koddy</del>               |
| 13 | <i>Schizostachyum brachycladum</i>                        | 68 | <i>Bambusa spinosa</i>                          |
| 14 | <i>Ochlandra</i> sp.                                      | 69 | ..  |
| 15 | <i>Thrysoetachys brachycladum</i>                         | 70 | <i>Bambusa vulgaris</i>                         |
| 16 | <i>Bambusa vulgaris</i>                                   | 71 | <i>Bambusa spinosa</i>                          |
| 17 | ..  | 72 | ..  |
| 18 | ..  | 73 | <i>B. vulgaris</i> ?                            |
| 19 | ..  | 74 | ..  |
| 20 | ? <i>D. flagellifer</i> ? <i>D. flagell.</i>              | 75 | ..  |
| 21 | <i>Bambusa vulgaris</i>                                   | 76 | <i>Ochlandra setigera</i> ? to verify           |
| 22 | ..  | 77 | <i>Bambusa vulgaris</i>                         |
| 23 | ..  | 78 | ..  |
| 24 | ..  | 79 | <i>Gigantochloa asper</i>                       |
| 25 | ..  |    | ..  |
| 26 | ..  |    | ..  |
| 27 | ..  |    | ..  |
| 28 | <i>Cephalostachyum</i> sp.                                |    | ..  |
| 29 | <i>B. vulgaris</i>  |    | ..  |
| 30 | <i>Ochlandra</i> sp.                                      |    | ..  |
| 31 | <i>Ochlandra setigera</i>                                 |    | ..  |
| 32 | <i>B. vulgaris</i>  |    | ..  |
| 33 | ..  |    | ..  |
| 34 | ..  |    | ..  |
| 35 | ..  |    | ..  |
| 36 | ..  |    | ..  |
| 37 | ..  |    | ..  |
| 38 | ..  |    | ..  |
| 39 | ..  |    | ..  |
| 40 | <i>Schizostachys brachycladum</i>                         |    | ..  |
| 41 | <i>Bambusa nana</i>                                       |    | ..  |
| 42 | <i>Schizostachyum brachycladum</i>                        |    | ..  |
| 43 | <i>Dendrocalamus Hamiltonii</i>                           |    | ..  |
| 44 | <i>Schizostachyum brachycladum</i>                        |    | ..  |
| 45 | ..  |    | ..  |
| 46 | <i>Gigantochloa</i> sp.?                                  |    | ..  |
| 47 | <del><i>Ochlandra</i></del> <i>Taeniostachyum Dalboia</i> |    | ..  |
| 48 | <del>sp.</del> <i>asper</i>                               |    | ..  |
| 49 | <del><i>Dendrocalamus</i></del> <i>(flagellifer)</i>      |    | ..  |
| 50 | <del><i>Bambusa</i></del> <i>tulda</i>                    |    | ..  |
| 51 | <i>Dendrocalamus pendulus</i>                             |    | ..  |
| 52 | <i>Schizostachyum Zollingeri</i>                          |    | ..  |
| 53 | <i>Gigantochloa Scortechinii</i>                          |    | ..  |
| 54 | <i>Dendrocalamus</i> sp.                                  |    | ..  |
| 55 | ..  |    | ..  |

## List of Bamboos in the Botanic Gardens, Singapore.

- |  |   |
|--|---|
| 1. Schizostachyum brachycladum ✓                                     | 35. B. vulgaris   |
| 2. " " ✓   | 36. " " ✓   |
| 3. " " ✓   | 37. " " ✓   |
| 4. Thrysostachys siamensis ✓   | 38. " <i>tuldores?</i>  |
| 5. ✓ Arundinaria <i># 4 clumps no. it (from the 1939)</i>            | 39. " <i>vulgaris</i>   |
| 6. Schizostachys brachycladum  | 40. Schizostachys brachycladum  |
| 7. Melocanna bambusoides ✓   | 41. Bambusa nana  |
| 8. Bambusa vulgaris ✓  | 42. Schizostachyum brachycladum <i>? 6 figs in the Nursery done</i>                             |
| 9. Cephalostachyum pergracile ✓                                      | 43. ✓ Dendrocalamus Hamiltoni <i>Nursery done</i>   |
| 10. <i>Schizostachyum Zollingeri</i><br>Bambusa vulgaris             | 44. <i>Bambusa vulgaris</i> <i>Nursery done</i><br><del>Schizostachyum brachycladum</del>       |
| 11. <i>Bambusa vulgaris</i>  | 45. " "   |
| 12. Dendrocalamus pendulus ✓   | 46. Gigantochloa sp. ? <i>to coll. shoot</i>  |
| 13. Schizostachyum brachycladum                                      | 47. Taeniostachyum Dulloa   |
| 14. Ochlandra sp. ✓  | 48. <i>Gigantochloa sp. (from Pahang)</i><br><del>Dendrocalamus asper</del> <i>(fide Ahmad)</i> |
| 15. Thrysostachys <i>siamensis</i> <del>brachycladum</del> ✓         | 49. Bambusa tulda   |
| 16. Bambusa vulgaris ✓   | 50. Dendrocalamus pendulus ✓  |
| 17. " " ✓  | 51. Schizostachyum Zollingeri ✓   |
| 18. " " ✓  | 52. Gigantochloa Scortechinii ✓   |
| 19. " " ✓  | 53. <i>Schizostachyum Zollingeri?</i>   |
| 20. <i>D. flagellifer</i> ✓  | 54. Dendrocalamus sp. ✓   |
| 21. <i>Bambusa vulgaris</i> ✓  | 55. " "   |
| 22. " " ✓  | 56. Bambusa vulgaris  |
| 23. " " ✓  | 57. Gigantochloa sp. ? ✓  |
| 24. " " ✓  | 58. <i>Bambusa vulgaris</i> "   |
| 25. " " ✓  | 59. <i>Gigantochloa</i> " ✓   |
| 26. " " ✓  | 60. Bambusa vulgaris ✓  |
| 27. " " ✓  | <i>Dendrocalamus Hamiltoni (to get spp.)</i><br>61. <del>Cephalostachyum sp.</del>              |
| 28. Cephalostachyum sp. ✓  | <i>Gigantochloa Scortechinii (Penang 1934)</i><br>62. Bambusa vulgaris x                        |
| 29. B. vulgaris ✓  | <i>Gigantochloa ligulata</i><br>63. Bambusa Blumeana x  |
| 30. Ochlandra sp.  | <i>Oxytenanthera nigrociliata</i><br>64. " <i>vulgaris</i> ✓                                    |
| 31. Ochlandra setigera ✓   | <i>Dendrocalamus tomentosus (Burma 45/34)</i><br>65. <del>Dendrocalamus Hamiltonii</del> x      |
| 32. B. <i>stenostachya</i> <i>from 107/37</i><br><del>vulgaris</del> | <i>Ochlandra? Ridlegi</i><br>66. Taeniostachyum Dulloa  |
| 33. " " ✓  | <i>arundinacea</i><br>67. Bambusa spinosa   |
| 34. " " ✓  | 68. " <i>Blumeana</i>   |



## Ridleyi

69. *Bambusa* ~~vulgaris~~  
*Oxytenanthera nigro-ciliata*
70. *Bambusa* ~~spinos~~
71. *Bambusa vulgaris* ✓
72. *B. vulgaris* ✓
73. " " ✓
74. " " ✓
75. *Ochlandra* ~~setigera?~~ <sup>*Ridleyi*</sup> ✓  
to verify
76. *Bambusa* ~~vulgaris~~ <sup>S.H.</sup>
77. *Bambusa vulgaris*
78. *Gigantochloa apus* ✓ <sup>as *B. vulgaris*</sup>
79. *B. vulgaris*
80. *Gigantochloa Kurzii*
81. *Dendrocalamus ciliiflorus* 87/36
82. *Gigantochloa Kurzii* (Origin *China* 87/36)
83. *Bambusa* ? *Ridleyi*
84. " 124/36 Holland Rd.
85. *Melocanna bambusoides*
86. ? *Arundinaria*
87. *Bambusa dolichoclada*, Hayata <sup>Formosa</sup> 107/37
88. *Dendrocalamus latiflorus*, Formosa 107/37
89. *Semiarundinaria fastuosa*, Japan
90. *Dendrocalamus pendulus* sp. n.
91. *Phyllostachys nigra*, 87/36.
92. *Arundinaria graminea*, 87/36.
93. *Phyllostachys edulis* 87/36.
94. *Phyllostachys nigra*, 87/36.
95. " *edulis*, 87/36.
96. *Pleioblastus gramineus*, Japan
97. *Pleioblastus Hindii*, Japan
98. *Chimonobambusa quadrangularis*, Japan
99. S.H.
100. S.H.
101. *Phyllostachys reticulata* var. *castillonis*, Japan
102. *Pseudosasa japonica*, Japan
103. S.H.
104. = ? 99.
105. *Saccharum senanensis*, Japan.
106. *Chimonobambusa marmorata*, Japan

